EXHIBIT F – DECLARATION OF JEFFREY D. PETERSOHN, M.D.

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Attorneys for Defendants Daniels, Wickham, Gittere, Reubart, Drummond, Minev, Green and Fox (NDOC Defendants)

UNITED STATES DISTRICT COURT

DISTRICT OF NEVADA

ZANE M. FLOYD,

Plaintiff,

v.

CHARLES DANIELS, DIRECTOR, NEVADA DEPARTMENT OF CORRECTIONS, ET AL.,

Defendants.

Case No. 3:21-cv-00176-RFB-CLB

DECLARATION OF JEFFREY D. PETERSOHN, M.D.

I, Jeffrey D. Petersohn, M.D., hereby declare based on personal knowledge and/or information and belief, that the following assertions are true.

1. I have been retained to provide expert testimony in the case *Floyd v. Daniels, et al.*, Case No. 3:21-cv-00176-RFB-CLB, currently pending before the United States District Court for the District of Nevada.

EDUCATION AND WORK EXPERIENCE

2. I am a board-certified anesthesiologist, receiving board certification from the American Board of Anesthesiology in 1990.

3. I attended medical school at Hahnemann University School of Medicine, located in Philadelphia, Pennsylvania, where I received my M.D. in 1984. Following

medical school and my internship, I undertook residencies in both internal medicine and anesthesiology, completing my anesthesiology residency in 1987.

4. Prior to attending medical school, I received my Bachelor of Arts in biophysics from The Johns Hopkins University, located in Baltimore, Maryland.

5. I have been in private practice since 1988 specializing in anesthesiology. I have further subspecialized in pain management since 1996.

6. From 2010-2019, I also taught anesthesiology as a Clinical Associate Professor of Anesthesiology and Perioperative Medicine at Drexel University College of Medicine, located in Philadelphia, Pennsylvania.

7. In 2019, I was appointed an Associated Professor in the Department of Anesthesiology at the University of Chicago in Chicago, Illinois.

8. The remaining aspects of my training, education and experience can be found in my curriculum vitae, which has been made available to this Court, the parties, and the public as **"Attachment 1"** to this Declaration. The only redaction made on the CV relates to my personal cell phone and email address.

SCOPE OF ENGAGEMENT

9. The purpose of my retention as I understand it is to provide this Court with my opinion as to the current method-of-execution protocol adopted by the Nevada Department of Corrections, which I understand is located on the Court docket at ECF No. 93-1, and as amended on June 21, 2021 at ECF No. 99-1. I refer to this protocol throughout this declaration as the "NDOC Protocol."

10. I had no role in the NDOC's deliberations associated with finalizing the NDOC Protocol. Instead, I have been retained to provide this Court with my understanding of the effects the NDOC Protocol will have on individuals who face the unfortunate and solemn sentence of death for their crimes.

11. In addition to providing medical and scientific explanations as to what is expected or anticipated to occur should the NDOC Protocol be utilized, I have also been asked to opine as to whether Mr. Floyd's requested alternative method of execution, which

I understand to be either firing squad or the use of a one drug alternative of either pentobarbital or sodium thiopental, would likely result in less pain or suffering to Mr. Floyd than the current drug regiment contained in the NDOC Protocol.

12. By providing my medical opinion as to what is anticipated to occur to a reasonable degree of medical certainty, I am not advocating for any particular form of lethal injection. The statements contained in this Declaration should be considered only from the perspective of providing this Court and the public with the medical facts as to what will or is likely to occur. It is not my intent to advocate for one method-of-execution over another nor to advocate for the death penalty.

DOCUMENTS REVIEWED IN PREPARATION OF THIS DECLARATION

13. In preparing my opinion as to the NDOC Protocol and Mr. Floyd's proposed alternatives to the NDOC Protocol, I have reviewed multiple documents, including the following documents that have been filed with the Court:

a. The NDOC Protocol dated June 9, 2021, and as amended on June 21, 2021 (ECF No. 93-1 and Nos. 99-1);

b. Plaintiff's Motion for Preliminary Injunction and Stay of Execution, dated June 18, 2021, ECF No. 98;

c. Plaintiff's Motion for Stay of Execution, dated April 21, 2021, ECF No. 10;

d. Plaintiff's Motion for Temporary Restraining Order with Notice and Preliminary Injunction, dated April 16, 2021, ECF No. 6;

e. Plaintiff's Exhibit 12, ECF No. 4-12;

f. Plaintiff's Exhibit 11, ECF No. 4–11;

g. Plaintiff's Exhibit 10, ECF No. 4-10;

h. Plaintiff's Exhibit 3, ECF No. 4-3; and

i. Plaintiff's Complaint, dated April 16, 2201, ECF No. 2.

14. I have not been asked to refrain from reviewing any particular documents, either filed in court or otherwise.

THE NDOC PROTOCOL IS LIKELY TO CAUSE A DEATH WITHOUT SIGNIFICANT PAIN OR SUFFERING

15. The NDOC Protocol provides for the use of a four drugs in the following order and dosages:

a. Fentanyl in the amount of 2,500 micrograms, or alternatively alfentanil in the amount of 25,000 micrograms (mcgs);

b. Ketamine in the amount of 1,000 milligrams (mgs);

c. Cisatracuriam in the amount of 200 mgs; and

d. Potassium Chloride or Potassium Acetate in the amount of 240 milliequivalents (mEq).

16. The NDOC Protocol also provides for the removal of cisatracuriam from the four-drug sequence. If that option is used, the NDOC Protocol notes that potassium chloride or potassium acetate would follow the injection of ketamine. The dosages for the drugs remain the same.

17. The NDOC Protocol also provides for the ability for additional amounts of each of these medications being provided to the inmate.

18. The NDOC Protocol also provides that the individual facing death will be offered the opportunity several times throughout the day to take an oral sedative that would commonly be used to allay anxiety.

19. Based on these drugs, dosages, and sequencing, and without advocating for the use of lethal drugs as a form of capital punishment, I have concluded upon a reasonable degree of medical certainty that the use of the drugs will result in the following physiological responses:

FENTANYL OR ALFENTANIL

20. The use of fentanyl of alfentanil, both potent opiates, will produce profound sedation, euphoria, and analgesia.

21. To explain what I mean by analgesia in this context, I will rely on the words of Craig W. Stevens, Ph.D, Professor of Pharmacology, in the report provided by Mr. Floyd

earlier in this litigation, albeit it was originally written for a different case using a different protocol. That report, located at ECF No. 4-12 states that fentanyl is a painkiller used for the treatment of moderate to severe pain. ECF No. 4-12 at 16. He also states that because of its analgesic effects it "inhibit[s] the activity of the pain neurons" producing "relief of pain." *Id*. I also agree with his premise that fentanyl "is 100 times more potent than morphine." *Id*.

22. The injection of either fentanyl or alfentanil at the dosages contained in the NDOC Protocol will substantially decrease alertness and respiratory drive.

23. I agree that the use of these drugs may cause chest rigidity which may make it more difficult for an individual to breathe. However, the analgesia effect of the 2500mcgs or 25,000mcgs dose of these drugs will be rapid, taking away any sensation the individual may have of either chest rigidity or a sensation of it being difficult to breathe in seconds, with hypoxia and unconsciousness occurring with minutes.

24. The inability of the individual being able to feel discomfort, severe or otherwise relating to chest rigidity or difficulty breathing is further evidenced by the successful treatment of thousands of individuals who, intentionally or accidently, overdose on fentanyl on a yearly basis. Despite this epidemic, caused in part due to the euphoric nature fentanyl provides to individuals, I am unaware of any study or anecdotal evidence that any of the individuals remember or complain about any discomfort associated with chest rigidity or difficulty in breathing caused by the overdose.

25. To be sure, it is reasonable to conclude the high dose of fentanyl or alfentanil provided for the NDOC Protocol, without life-saving measures, will cause unconsciousness and death in itself.

26. In this regard, I agree with the statement made by Dr. Greenblatt in his declaration provided by Plaintiff as Exhibit 11. There, he stated that fentanyl "can be lethal in minute amounts." ECF No. 4-11 at 27, ¶ 71. And I therefore agree that should fentanyl (or alfentanil) be used in a clinical setting, it is important that it "be handled only by appropriately trained, medical professionals." *Id*. However, because here, the NDOC

Protocol is designed to end in the death of an individual, the lethal nature of these drugs in minute amounts (even less than the 2,500mcg or 25,000mcg), the need for appropriately trained medical professionals is mitigated (although the NDOC Protocol notes there will be an attending physician or other appropriate medical personnel present), as the reason they are needed is to ensure the use of fentanyl or alfentanil does not result in death of the patient when used in the clinical setting. It is for this reason that Dr. Stevens noted that fentanyl is part of "a dangerous group of medicines that are responsible for many intentional and unintentional fatalities." ECF No. 4-12 at 19.

27. While I have not addressed Dr. Waisel's statements relating to fentanyl in here, that is intentional. Given his opinion focused fentanyl at a much smaller dose of 1,000mcg, making any comparison to his statements pertaining to fentanyl unhelpful to the analysis of the current NDOC Protocol. Indeed, the opinions of the other individuals Mr. Floyd provided as exhibits to his Complaint—but did not reference at all in his most recent Motion for Stay—are all of limited assistance as none of them address the use of fentanyl or alfentanil with the use of ketamine as called for in the current NDOC Protocol.

28. Mr. Floyd's Motion filed on June 18, 2021 does not cite to any medical or scientific experts, medical reports, medical or scientific studies, or any other peer reviewed documentation. Nonetheless, in addition to the medical evidence presented above regarding fentanyl and alfentanil, which I believe adequately and appropriately informs this Court as to why Mr. Floyd's statements, as a matter of medical science, are not supported, I do find it important to inform the Court that while Mr. Floyd correct asserts that alfentanil's active analgesic effect if shorter than that of fentanyl, there is no medical support for Mr. Floyd's conclusory statement that "alfentanil is too short acting to safely serve as a first drug administered in a three- or four-drug protocol. ECF No. 98 at 15:6.

29. The NDOC Protocol calls for all medications to be injected in a timeframe of approximately twelve (12) minutes, if using the four-drug option, or nine (9) minutes if using the three-drug option. This time may be increased by a few minutes depending on the amount of time needed to perform the consciousness checks contained in the NDOC

Protocol. Based on that timing, while Mr. Floyd is correct that alfentanil lasts a shorter amount of time than fentanyl, the time of its analgesic effect surpasses the time needed for the NDOC Protocol to be completed through the last injection of either potassium chloride or potassium acetate.

30. The NDOC Protocol also has taken into account the potential of additional alfentanil (or any drug) being needed as it allows for additional dosages to be provided to titrate to effect. This is another safeguard against Mr. Floyd's unsubstantiated medical assertion that alfentanil will not last long enough.

KETAMINE

31. The NDOC Protocol calls for ketamine to be injected as the second drug. Ketamine will block a particular transmitter, known as NMDA. Based on the 1,000mg dose contained in the NDOC Protocol, the medical result will be do produce deep analgesia and sedation, including "dissociative anesthesia," which is best described as a comatose, immobilized state of consciousness. Indeed, a dose of approximately 160mg will to a reasonable degree of medical certainty result in a rapid onset of a profound lack of any pain awareness or even the individual's circumstances. By contrast, the NDOC Protocol calls for 1,000mg of ketamine to be injected—an amount 6x larger than the therapeutic dose of 160mg referenced in the previous sentence.

32. Due to the rapid, profound, and significant pain relief associated with ketamine, it is a drug of choice for anesthesiologists for emergency surgeries or for the care of patients with burn injuries. Ketamine has a unique property called "dissociative anesthesia," which produces complete unawareness in the patient.

33. The pain-relieving effects of ketamine coupled with the fentanyl or alfentanil may likely result in irreversible unconsciousness and respiratory suppression resulting in death, even without adding either cisatracuriam or either potassium-based drugs set forth in the NDOC Protocol. However, even if it does, the unconsciousness and respiratory suppression will not cause, to a reasonable degree of medical certainty pain or discomfort

given the dissociation, deep analgesic and pain killing properties contained in not only ketamine, but also fentanyl and alfentanil.

34. While Mr. Floyd has not provided any medical evidence or support his opposition to ketamine, he focuses on generalized issues regarding what may occur during its use or upon awakening a patient from the induced state it provides, specifically claiming that it can cause psychosis or hypersalivating, which could lead to vocal cord spasms or vomiting. *See generally* ECF No. 98 at 15:17-16:2. However, hypersalivation occurs in less than 1% of patients provided ketamine and is therefore not likely to occur, especially when ketamine is provided to the individual as the second drug following either fentanyl or alfentanil. In addition, the concern of psychosis for individuals being resuscitated after using ketamine in a clinical setting is not relevant in this context, as again, the individual is not anticipated to be resuscitated.

35. Mr. Floyd has not provided any reports or other medical or scientific evidence or opinion regarding the use of ketamine and therefore there is no alternative opinions for me to address or explain.

CISATRACURIAM

36. Cisatracuriam, which may be used as the third drug in the NDOC Protocol, is a muscle relaxant that, in a dosage amount of 200mg will result in paralysis. The paralysis will result in the individual not being able to move the diaphragm, interfering in further ability of the individual being able to breathe–assuming the individual is still doing so after being injected with the high volume of fentanyl (or alfentanil) and ketamine that the individual has already been injected with per the NDOC Protocol. To the extent the individual is still breathing when cisatracuriam is injected, given the profound respiratory suppression and unconsciousness brought on by fentanyl/alfentanil and ketamine, the individual will, to a reasonable degree of medical certainty, not feel anything. Rather, the cisatracuriam will hasten the onset of death by impairing the respiratory functions even more profoundly than the introduction of fentanyl or alfentanil. However, due to the profound respiratory depression produced by the fentanyl or alfentanil, cisatracuriam may

be omitted from the NDOC Protocol should NDOC choose to proceed under the 3-drug regimen.

37. Mr. Floyd has again provided no medical or scientific evidence regarding the use of cisatracuriam in the NDOC Protocol. Because there is no discussion of the use of the drug along with fentanyl/alfentanil, ketamine, and either potassium chloride or potassium acetate, the little discussion of cisatracuriam raised in the expert of the other cases provided by Mr. Floyd at the time of the filing of his Complaint is of little assistance as those uses cannot be easily compared to its usage and dosage in the current NDOC Protocol. In this regard, I note that Dr. Waisel's discussion and criticism of cisatracuriam was in the context of a protocol that called for the use of diazepam and a much lower dose of fentanyl, whereas here, the amount of fentanyl/alfentanil and ketamine provided to the individual is such a high dosage, the ability of the individual to "be aware for 3-5 minutes *after* the person stops breathing" as suggested by Dr. Waisel is simply not a medical concern, especially given the other analgesic and dissociative state the individual will be in after the injection of fentanyl/alfentanil and ketamine.

38. Dr. Waisel's concerns based on the previous protocol are also assuaged in the NDOC Protocol because in the protocol Dr. Waisel considered, he opined the concern was using cisatracuriam as the "killing agent" without first being given an anesthetic agent, *see* ECF no. 4-3 at 4, ¶ 6, whereas here, as discussed above, the individual two medications used an anesthetic agents routinely. In addition, unlike in the protocol previously reviewed by Dr. Waisel, cisatracuriam will be followed by the use of either potassium chloride or potassium acetate, which, as Dr. Waisel states, "stops the heart very quickly." *Id*. Therefore, Dr. Waisel's concerns of cisatracuriam being the killing agent are not present in the NDOC Protocol.

39. Dr. Stevens concerns regarding cisatracuriam were also based on his opinion that midazolam would not "render a person insensate to pain," ECF No. 4-12 at 10, an issue not relevant here given the use of both fentanyl/alfentanil and ketamine for that purpose.

Dr. Stevens also opines that "cisatracuriam must not be given to an inmate[1] unless the innate is already in a state of general anesthesia, otherwise there would be severe pain and suffering experienced by the inmate." *Id.* at 22. However, here, assuming that could be concern, the NDOC Protocol has built in assurances that the individual will be in a state of general anesthesia, not only through the use of high dosages of fentanyl/alfentanil and ketamine initially, but also through the use of consciousness checks and the ability to use additional ketamine before the introduction of cisatracuriam.

40. Dr. Greenblatt's concerns regarding cisatracuriam are similar to those provided by Dr. Stevens, namely that the individual "must be made insensate prior to [its] delivery." ECF No. 411 at 15, ¶ 39. As the inmate will be rendered unconscious, i.e. insensate by the fentanyl/alfential and ketamine, this is not a concern to be considered.

Potassium Chloride or Potassium Acetate

41. The last drug in the NDOC Protocol, whether as part of the three- or four-drug combination is either potassium chloride or potassium acetate at a dosage of 240mEq. As the effective ingredient in these drugs is potassium, regardless of which salt is used, I will simply refer to this as potassium without differentiation.

42. The use of potassium will stop the individual's heart, resulting in cardiac arrest.

43. While potassium is known to be irritating to veins if injected rapidly, which I understand Mr. Floyd has referred to as "extreme pain," that is not a concern as used in the NDOC Protocol due to the use of both fentanyl/alfentanil and ketamine prior to it being injected. The effects of the fentanyl/alfentanil and ketamine will result in such a profound state of anesthesia and unconsciousness, and to a reasonable degree of medical certainty ensure, that the individual will feel nothing when the potassium is injected.

Response to Mr. Floyd's General Objections to These Medications

44. Mr. Floyd generally objects to the use of either of three- or four-drug procedure because it has never been used before and therefore it may not be effective or should not be

[1] I use the term "inmate" only as this is a quote from Dr. Stevens.

presumed to be effective. However, this assertion, made by Mr. Floyd without any medical support or evidence, strains medical credibility. To be sure, the effects of each of the proposed drugs contained in the NDOC Protocol are well understood, but on lower dosages, the dosages called for in the NDOC Protocol, and both separately and as used in various combinations. There simply is no medical reason to believe that these drugs, as set forth in the NDOC Protocol and used in the manner contained therein, will not result in death of the individual. To be clear, just as if these drugs were being used in the operating room, absent manual and intentional efforts to support the airway, and assuming potassium is not omitted from the NDOC Protocol, it is not medically foreseeable that the NDOC Protocol would be nonlethal. Indeed, given the dosages of fentanyl or alfentanil administered, the respiratory depression produced by these drugs alone is medically likely to be sufficient to produce death.

Comparing the NDOC Protocol to Mr. Floyd's Single Drug Alternatives

45. Mr. Floyd also suggests that a single dose of either sodium thiopental or pentobarbital would be preferable to the drugs contained in the NDOC Protocol as the single does of either sodium thiopental or pentobarbital, in Mr. Floyd's opinion, would "significantly reduce the substantial risk of pain inherent in Nevada's current protocol." ECF No. 98 at 1:11–12.

46. I respectfully disagree with Mr. Floyd's unsupported medical assertion in this regard. Neither sodium thiopental nor pentobarbital produce analgesia when used separately. By contrast, the NDOC Protocol's use of fentanyl/alfentanil, coupled with the mandatory use of ketamine, with or without the individual choosing to voluntarily use oral sedatives leading up to the execution, will, to a reasonable degree of medical certainty, result in a deep state of not only unconsciousness but also sedation and analgesia. Mr. Floyd's position therefore that either sodium thiopental or pentobarbital are likely to "significantly reduce the substantial risk of pain" lacks merit as it is without medical foundation.

Comparing the NDOC Protocol to Firing Squad

47. Mr. Floyd also claims—without citation to any medical support in the body of this Motion or attached as an exhibit—that the use of a firing squad would, among other things, "cause[] a faster and less painful death than execution by lethal injection." ECF No. 98 at 18:21–22.

48. While I agree with Mr. Floyd that a firing squad, assuming it goes as planned, will cause a quicker death, I do not agree to a reasonable degree of medical certainly that the death would be less painful. This is because while the death, again assuming the bullet or bullets do not miss the intended target, whether it be the brainstem or heart, would be quicker, it would also be brought about without the use of any medication that would render the individual unconscious, sedate, or in a state of anesthesia, the timeframe between when the individual is shot until death would result in a traumatic injury that, to a reasonable degree of medical certainty, would result in incomparable pain when compared to the drugs the NDOC Protocol will provide the individual intravenously. Three of the four drugs are routinely used in surgical setting for the very purpose of ensuring that the patient does not feel pain during surgery.

49. In addition, while I concede that death by firing squad is quicker if the bullet or bullets hits the intended targets, there are many medical case reports detailing bullets passing through the skull without causing loss of consciousness or death. If the bullet or bullets were to miss major neural pathways or the brainstem, it is likely the individual shot will remain conscious—and without any painkiller to assist with the excruciating pain of being shot.

50. In sum, there is simply no medical evidence to support the proposition that death by firing squad is likely to result in less pain than the use of medications specifically designed to reduce pain, unconsciousness, or both.

Conclusion

51. Without condoning or supporting the use of the NDOC Protocol or any other medication for purposes of ending one's life by way of lethal injection, I attest that, to a

reasonable degree of medical certainly, likely to be less than the pain or discomfort associated with being shot to death by way of a firing squad.

54. Nor is any pain or discomfort associated with the NDOC Protocol likely to be any more than the pain or discomfort one would experience if sodium thiopental or pentobarbital was used in lieu of the drugs called for in the NDOC Protocol.

55. I declare under penalty of perjury pursuant to 28 U.S.C. section 1746 that the foregoing is true and correct.

EXECUTED this 23rd day of June, 2021.

Dr. Jeffrey D. Petersohn
Medical Doctor
Board-Certified Anesthesiologist

ATTACHMENT 1 – CV

Jeffrey D. Petersohn, M.D.

[redacted]

ACADEMIC APPOINTMENTS

2010-2019 Clinical Associate Professor, Department of Anesthesiology and Perioperative Medicine. Drexel University College of Medicine. Philadelphia, PA

2019 Associate Professor, Department of Anesthesiology, University of Chicago. Chicago, IL

ACADEMIC TRAINING

1975-1979 B.A., Biophysics. The Johns Hopkins University, Baltimore, MD

1980-1984 M.D. Hahnemann University School of Medicine, Philadelphia, PA

1984-1985 Intern, Internal Medicine. Hahnemann University Hospital, Philadelphia, PA

1985 Resident, Internal Medicine, Hahnemann University Hospital, Philadelphia, PA

1986-1987 Resident, Anesthesiology, Hahnemann University Hospital, Philadelphia, PA

CLINICAL/PROFESSIONAL PRACTICE OF MEDICINE

1988-1989 Middle Tennessee Anesthesiology, PC Nashville, TN – Anesthesiology group practice

1990-1991 Delaware County Memorial Hospital, Lansdowne, PA – Anesthesiology group practice

1991-1992 Chairman, Department of Anesthesiology- Franklin Square Hospital/Franklin Square Anesthesiology Associates, Philadelphia, PA –- Anesthesiology group practice including cardiac anesthesia

1992-1995 Chairman, Department of Anesthesiology, Burdette Tomlin Memorial Hospital, Cape May Court House, NJ – Multispecialty community anesthesiology practice including establishment of pain clinic.

1995-1996 Staff anesthesiologist, Atlantic City Medical Center, Atlantic City, NJ. Regional hospital anesthesiology practice including regional trauma center. Established Center for Pain Medicine

1996-present PainCare, PC, president. Private Interventional Pain Medicine practice – Linwood, NJ and Englewood, CO.
Subspecialty consultative referral practice offering full-spectrum interventional pain care including transforaminal injections, diagnostic/therapeutic orthopedic, spinal and peripheral nerve injections, RF lesioning, diagnostic discography, interventions for discogenic pain, kyphoplasty, spinal cord and DRG stimulation, interspinous spacers, sacroiliac joint fusion, lumbar transforaminal and interlaminar full-endoscopic discectomy/foraminotomy/facetectomy.

BOARD CERTIFICATION AND LICENSURE

1990 American Board of Anesthesiology, Diplomate in Anesthesiology

1996 American Board of Anesthesiology, Certificate of Added Qualifications in Pain Medicine
2006, 2016 American Board of Anesthesiology, Recertification, Certificate of Added Qualifications in Pain Medicine – valid through 2026

Current unrestricted medical licensure: Commonwealth of Pennsylvania, State of Colorado (SPL 2019), State of New Jersey.

Current DEA certification Schedules II-V
Current ACLS/BLS certification
US Citizen

SCHOLARSHIP

Peer-reviewed publications in the primary literature, exclusive of abstracts:

2008 Petersohn J, Conquergood L, Leung M. Acute histologic effects and thermal distribution profile of disc biacuplasty using a novel water-cooled bipolar electrode system in an *in vivo* porcine model. Pain Medicine 2008, Jan-Feb; 9(1):26-32.

2012 Petersohn J. Advances in biological techniques for treatment of lumbar discogenic pain. Techniques in Regional Anesthesia and Pain Medicine. 2012, 16(2):89-94. 2012

2013 Sadacharam K, Petersohn J, Green MS. Inadvertent subdural injection during cervical transforaminal epidural steroid injection. Case Reports in Anesthesiology 2013, article ID 847085, doi:10.1155/2013/847085.

2015 Franco C, Buvanendran A, Petersohn J, Menzies R, Pham-Menzies L. Innervation of the anterior capsule of the human knee: Implications for radiofrequency ablation. Regional Anesthesia and Pain Management 2015 Jul-Aug; 40(4):363-368.

2016 Desai M, Kapural L, Petersohn J, Vallejo R, Mekhail N, Menzies R, Creamer M, Gofeld M. A prospective randomized multicenter open label clinical trial comparing intradiscal biacuplasty to conventional medical management for discogenic lumbar back pain. Spine 2016, July 1; 41(13):1065-1074.

2016 Petersohn J. Radiofrequency strategies to target peripheral large joint orthopedic pain. Techniques in Regional Anesthesia and Pain Management 2016, Jul-Oct; 19(3-4): 131-137.

2017 Desai M, Kapural L, Petersohn J, Vallejo R, Menzies R, Creamer M, Gofeld M. Twelve month follow up of a randomized clinical trial comparing intradiscal biacuplasty to conventional medical management for discogenic lumbar back pain. Pain Medicine 2017, April 1; 18(4): 751-763.

Book chapters:

2011 Petersohn J. "Sympathetic neural blockade: in Lennard T. et.al. (eds). Pain Procedures in Clinical Practice, 3rd ed. Elsevier Saunders.

2012 Petersohn J. "Discogenic pain: Intradiscal therapeutic injections and use of intradiscal biologic agents" in Deer T. et. al. (ed) Diagnosis, management and treatment of discogenic pain. Elsevier, Philadelphia.

2015 Desai M, Petersohn J, O'Brien J, Cyriac M, Lati C. "Lumbar disc displacement" in Hayek S, Desai M, et. al. (eds) Pain Medicine: an interdisciplinary case-based approach. Oxford University Press, New York.

2015 Petersohn J, Padmanabhan, Desai M. "Whiplash associated disorder and cervical facet pain" in: Hayek S, Desai M, et. al. (eds) Pain Medicine: an interdisciplinary case-based approach, Oxford University Press, New York.

2017 Petersohn J. "Cervical transforaminal/nerve root injections: Fluoroscopy" in Narouze, S (ed). Multimodality imaging guidance in interventional pain management." Oxford University Press, New York.

2017 Petersohn J. "Cervical radiculopathy" in Desai M (ed) The Spine Handbook. Oxford University Press, New York.

2021 Petersohn, J. "Spinal diagnostics" in Abd-Elsayed A, et. al. (ed) Minimally invasive procedures in pain management. Oxford University Press, New York (manuscript in preparation).

2021 Petersohn, J, Gupta M. "Spinal endoscopy" in Abd-Elsayed A, et. al. (ed) Minimally invasive procedures in pain management. Oxford University Press, New York (manuscript in preparation).

Research abstracts

2009 Petersohn J, "Role of repetitive provocation discography", International Spine Intervention Society Annual Meeting, Toronto, Canada. Pain Medicine 2009 September(5):382-383.

2010 Petersohn J. "Outcomes of algorithmic treatment of lumbar z-joint pain using single diagnostic medial branch block and RF lesioning with mandated treatment of co-existing or novel sacroiliac pain". International Spine Intervention Society, Maui, HI.

2011 Petersohn J. "Improved diagnostic precision with use of declined posterior oblique technique for lumbar medial branch block" American Academy of Pain Medicine Washington, DC.

2015 DiMauro J, Petersohn J, Menzies R, Buanendran A, Franco C. "A novel technique for obturator articular branch block". American Society for Regional Anesthesia and Pain Management.

2016 Gofeld M, Desai MJ, Kapural L, Petersohn JD, Vallejo R, Menzies R, Creamer M. Long term results (12 months) of a prospective, multicenter, open label clinical trial comparing Intradiscal biacuplasty to conventional medical management for discogenic lumbar back pain.

2016 Aman MM, Petersohn J. "Saphenous nerve cooled radiofrequency ablation for the treatment of refractory lower extremity chronic regional pain syndrome". American Society of Anesthesiology.

Clinical trials – unpublished

2015-2016 Principal Investigator Halyard Health Pain Visualization Clinical Pilot Study. Demonstration of clinical diagnostic utility of cortical evoked potentials in humans to identify painful lumbar zygapophyseal joints. Status: complete. Data and publication embargoed as proprietary by study sponsor.

HONORS, PRIZES, AND AWARDS

1984 Senior Honors in Pediatrics and Internal Medicine, Hahnemann University College of Medicine

2016 Aliaga Research 1st Prize, "RF implications of anterior geniculate capsular neuroanatomy", American Society of Interventional Pain Physicians

INVITED SPEAKING

Local/Regional

1988 "Embolic events in clinical anesthesia" – Tennessee Association of Nurse Anesthetists.
1989 "Addiction Issues in Chronic Pain Management", Academy of Medicine of New Jersey.
1999 "Opiate use in the New Millennia" – Bridgeton Hospital , NJ
1999 "Contemporary Use of Slow-Release Opiates" – Atlantic City Medical Center, Mercer Medical Center (Medical resident lectures).
2001 "Pharmacology of opiate analgesics" – Atlantic County Pharmacy Society.
2002 "Forensic use of discography" - American Trial Lawyers Association, New Jersey.
2006 "My Aching Neck". Central Jersey Claims Association, October.
2010 "RF Lesioning in the Treatment of Low Back Pain" Grand Rounds- Department of Anesthesiology Hahnemann University Hospital, Philadelphia, PA. June.
2011 "Indications and planning for cooled RF lesioning techniques" Illinois Society for Interventional Pain Practice. Chicago, IL March.
2011 "Advanced techniques in RF lesioning" Grand Rounds – Department of Anesthesiology Hahnemann University Hospital, Philadelphia, PA. October.
2012 "Discogenic Pain" Grand Rounds – Department of Anesthesiology, Hahnemann University Hospital, Philadelphia, PA. October.
2012 "The Proper Use and Abuse of Epidural Steroid Injections" Grand Rounds – Department of Anesthesiology, Hahnemann University Hospital, Philadelphia, PA December.

2016 "Diagnosing lumbosacral pain by application of overlapping pathoanatomic subsets" Grand Rounds – Department of Anesthesiology, Hahnemann University Hospital October.

National

2006 "Biacuplasty for Treatment of Discogenic Pain". International Spine Intervention Society, Salt Lake City, Utah, July.
2006 "Driving Innovative Products into Physician's hands – A Clinicians Perspective", Kimberly Clark Medical, Orlando, Florida, October.
2007 "Biacuplasty – Procedural Considerations", Spinemark, Dallas, Texas March 2007 also MERI, Memphis, Tennessee, November.
2007 "Transdiscal Annuloplasty Technique, Rehabilitation and Complications" (Lecturer and cadaveric workshop instructor). Cleveland Clinic, Cleveland, Ohio, April.
2007 "RFL Lesioning in Cervical, Thoracic and Lumbar Spine", Advanced Techniques in RF lesioning (Course Director, lecturer and clinical instructor). Vitruvian Institute, Baltimore, Maryland, April.
2007 "Transdiscal Annuloplasty and Physics of Cooled RF lesioning", "The Painful Sacroiliac Joint" (Course Director, lecturer and clinical instructor) Vitruvian Institute, Baltimore, Maryland, August.
2008 "Clinical applications of RF lesioning", Invited lecture to the New York Physical Medicine and Rehabilitation Society, Hospital for Special Surgery, New York, NY, September.
2009 RFL Lesioning in Cervical, Thoracic and Lumbar Spine (Lecture and cadaveric workshop – Pfiedler Enterprises), Aurora, CO, April.
2010 "Anatomy and Technique for Lumbar Cooled RF Lesioning" (Lecture and cadaveric workshop) Pfiedler Enterprises/Kimberly Clark Medical, Miami, FL January.
2010 "Complications and Risk Reduction Strategies for Cervical and Thoracic ESI/SNR's", "Complications of RF Lesioning." Invited lecture - American Academy of Pain Medicine Annual Meeting, San Antonio, TX, February.
2010 "Anatomy and Technique for Lumbar and Thoracic Cooled RF Lesioning" (Lecture and cadaveric workshop) Pfiedler Enterprises/Kimberly Clark Medical, Boston, MA, February.
2010 "Anatomy and Technique for Lumbar Cooled RF Lesioning" (Lecture and cadaveric workshop) Pfiedler Enterprises/Kimberly Clark Medical, Burr Ridge, IL April.
2011 "Anatomy and Technique for Lumbar Cooled RF Lesioning" (Lecture and cadaveric workshop) Pfiedler Enterprises/Kimberly Clark Medical, Miami Anatomic Research Center, February.
2012 "Thoracic RF lesioning techniques" Lecture and cadaveric workshop (Pain Fellows Course) Rush University Medical Center, Chicago, IL October.
2013 "Finesse in cervical injections", "Digital subtraction angiography". The Cleveland Clinic 15th Annual Pain Management Symposium. Sarasota, Florida February.
2014 "Digital subtraction angiography", "Cooled RF ablation", "Treatment of sacroiliac joint pain" Lectures. Thoracic facet RFL – cadaveric workshop. The Cleveland Clinic 16h Annual Pain Management Symposium. Las Vegas, NV February.
2014 "Digital subtraction angiography" Lecture. "Cervical transforaminal injection" Workshop lead instructor. American Society of Regional Anesthesia and Pain Medicine. San Francisco, CA December.
2015 "RF denervation for management of hip and knee pain" Invited lectures and cadaver workshop. Hospital for Special Surgery, New York, New York January.
2015 "Biacuplasty" New Jersey State Society of Interventional Pain Physicians, New Brunswick, NJ June.

2016 "RF denervation of the hip and knee" Cadaveric workshop. New Jersey/New York Societies of Interventional Pain Physicians, Jersey City, NJ November.
2016 "Complex regional pain syndrome" Lecture. "Migraine headache", "RF denervation of the knee" Problem based learning discussion. "RF denervation of cervical and thoracic facet joints", "RF denervation of hip and knee" Cadaveric workshop. American Society of Regional Anesthesia and Pain Medicine, San Diego, CA. November
2017 "Biacuplasty", "Monopolar cooled RF lesions" Lecture, cadaveric workshop New Jersey/New York Societies of Interventional Pain Physicians Jersey City, NJ October.
2017 "Head and cervical spine blocks: fluoroscopy" (Workshop lead instructor), "Hip and knee blocks and RFL: fluoroscopy" (Workshop lead instructor). American Society for Regional Anesthesia and Pain Medicine, Orlando, FL November.
2018 "Degenerative disc disease (DDD) 2018: New Insights and Recent Evidence for Spine Interventions", "Legislative Update/State of the Society" Lecture. "RF denervation of the hip and knee" Cadaveric workshop. New Jersey/New York Societies of Interventional Pain Physicians. Jersey City, NJ November.
2018 "Notable Recent Evidence for Spine Interventions", "Reading and Interpretation of Spinal Imaging and EMG: Correlating Studies to Pain Symptoms: Correlating MRI findings to Pain Generators", Direct and indirect spinal decompression, disc decompression -Workshop lead instructor. Moderator for poster session. American Society of Regional Anesthesia and Pain Medicine 18th annual meeting, San Antonio, TX November.
2019 "Practice Management Lectures: Private practice with in-office operating room"; "Basic lumbar injections and basics RF cadaver workshop"- Lead Instructor, "Discography and biacuplasty cadaver workshop" – Lead Instructor; "Basic kyphoplasty and vertebroplasty techniques cadaver workshop" – Lead instructor, "RF lesioning of the sacroiliac joint cadaver workshop" – Senior instructor. American Society for Regional Anesthesia and Pain Medicine 19th annual meeting, New Orleans, LA.

International

2006 "Diagnosis and Treatment of Discogenic Pain" – Guangzhou Society of Anesthesiologists, Guangzhou, China.
2008 "Minimally invasive treatments for low back pain","Clinical Use of Discography", "Imaging of back pain", Live video demonstration of provocative discogram, Live video demonstration of lumbar disc biacuplasty operative procedure. Invited lecturer and Clinical Instructor. 8th Asia Pacific Congress of Cardiovascular and Interventional Radiology. Kuala Lumpur, Malaysia, June.
2008 "Pearls and pitfalls in clinical discography", "Biacuplasty for discogenic pain: Physics of bipolar cooled RF, procedure, potential complications and post-op care", Invited lecturer. 1st Symposium for use of Radiofrequency Applications in Pain Management, Taichung, Taiwan, June.
2010 "Thoracic RF lesioning using cooled-RF probe technology". Invited lecture and cadaveric workshop. University of Leuven. Leuven, Belgium October.
2012 "Biologic factors in discogenic pain" Lecture. 3rd World Congress of Minimally Invasive Spine Surgery and Techniques. Praia do Forte, Bahia, Brazil August.
2013 "Cooled RF lesions for cervical zygapophyseal pain". Lecture and cadaveric workshop. Academisch Medisch Centrum. Amsterdam, Netherlands June.
2013 "Cooled RF lesions for cervical zygapophyseal pain". Lecture and cadaveric workshop. Academisch Medisch Centrum. Bangkok, Thailand October.
2013 "Comprehensive review of interventional treatments for peripheral joint pain", "Comprehensive review and comparison of disc treatments; how to improve the

outcome", "Discography: Its current use and controversies" Lectures and cadaveric workshops. Comprehensive Reviews of Spinal Imaging and Radiofrequency in Interventional Pain Procedures. World Institute of Pain. London, England December.

2014 "Spinal cord stimulation for axial pain", "Minimally invasive treatment of discogenic pain" Lectures and cadaveric workshop. Annual Review Course World Institute of Pain, St. Georges University School of Medicine. London, England June.

INVITED, ELECTED, OR APPOINTED EXTRAMURAL SERVICE

2006-2008	North American Spine Society, CME Committee, member
2006-2008	North American Spine Society SpineLine Editorial Board, member
2008-2014	Kimberly Clark Medical Pain Management Advisory Board, member
2009-2011	International Spinal Intervention Society Standards Committee, member
2009-2011	North American Spine Society, Evidence Based Medicine task force
2012-2014	GE Medical Imaging Advisory Board, member
2013-2015	Secretary, New Jersey State Society of Interventional Pain Physicians
2014-2018	American Society for Regional Anesthesia. National 2018 Meeting Planning Committee, member
2015-2017	Treasurer, New Jersey State Society of Interventional Pain Physicians
2015-2019	Novitas Medicare – Regions J/L (Pennsylvania/New Jersey) Clincial Advisory Committee, Interventional Pain specialty representative
2017-2019	President, New Jersey State Society of Interventional Pain Physicians
2017	Guest Editor, Special issue on radiofrequency lesioning techniques. Techniques in Regional Anesthesia and Pain Medicine.
2019	New York/New Jersey Societies of Interventional Pain Physicians – Annual meeting course co-director.
Various	Manuscript reviewer for Pain Medicine (2006-present), Pain Practice (2009-present), Regional Anesthesia and Pain Medicine (2019)

PROFESSIONAL SOCIETIES

1996-2017	(International) Spine Intervention Society
2006-2011	North American Spine Society –
2015-2017	American Society of Interventional Pain Physicians
2013-present	American Society for Regional Anesthesia and Pain Medicine
2012-present	New Jersey State Society of Interventional Pain Physicians

EDUCATION

Drexel University College of Medicine (M.D.):

(a) Didactic

2011-2018 Departmental Grand Rounds – various topics including "Receptor pharmacology in pain", "Use and abuse of epidural steroid injections", "Advanced RF lesioning techniques", "Understanding low back pain by pathoanatomic subsets" – annual lecture

(b) Clinical

2010-2019 Clinical residency training site in Interventional Anesthesiology for CA-2, CA-3 residents.
Typically 2-4 months per academic year.

Graduate medical education (residency and clinical fellowships):

(a) Didactic

2014, 2015 Chicago Regional Fellows Course in RF Lesioning techniques

2010-2019 Daily clinic and OR rotation for CA-2 and CA-3 residents, 2-4 months per year

Continuing medical education:

2007 "Clinical Use of Discography", "Pearls and Pitfalls in Clinical Discography", Lecturer and Clinical Instructor, Discography. North American Spine Society, Tucson, Arizona, March.

2007 "Lumbar epidural steroid injections", "Transforaminal epidural steroid injections: Rationale, methods and outcomes." Lecturer and Clinical Instructor. North American Spine Society Annual Meeting, Austin, Texas, October.

2008 "Clinical Use of Discography", "Pearls and Pitfalls in Clinical Discography", Lecturer and Clinical Instructor,. North American Spine Society, Chicago, Illinois, March.

2008 "The sacroiliac joint: The good, the bad, the ugly", Georgia Society for Interventional Pain Practice Annual Meeting, Lake Oconee, GA, August.

2009 "Analgesic Discography – Con." Invited program debate speaker. International Spine Intervention Society Annual Meeting, Toronto, CA, July.

2009 "Cooled RF lesioning techniques - Disc biacuplasty, SI denervation", Invited lectures - Georgia Society for Interventional Pain Practice Annual Meeting, Lake Oconee, GA, August.

2010 "Cooled RF Lesions for Thoracic and Lumbar z-joint pain" New Jersey Society for Interventional Pain Practice New Brunswick, NJ January.

2010 "RFL Lesioning in Cervical, Thoracic and Lumbar Spine" (Lecture and cadaveric workshop – Pfiedler Enterprises. Spinemasters Institute, Burr Ridge, IL (Chicago), April.

2011 "RFL Lesioning in Cervical, Thoracic and Lumbar Spine" (Lecture and cadaveric workshop – Pfiedler Enterprises. Miami Anatomic Research Center, February.

2012 "Cervical Axial Pain", "A pain in the buttock" (Lectures and cadaveric workshop) – Pfiedler Enterprises. Tampa, FL. March, also Las Vegas, NV October..

2013 "Finesse in Cervical Injections", "Digital Subtraction Angiography" Invited CME lecture. The Cleveland Clinic 15th Annual Pain Management Symposium, Sarasota, FL February.

2013 "Comprehensive review of interventional treatments for peripheral joint pain", Comprehensive review and comparison of disc treatments; how to improve the outcome". "Discography: Its current use and controversies" Lectures and cadaveric workshop Comprehensive Reviews on Spinal Imaging and Radiofrequency in Interventional Pain Procedures. World Institute of Pain. London, England December.

2014 " Digital subtraction angiography", "Cooled RF ablation", "Treatment of sacroiliac joint pain" , Invited lectures and cadaveric instructor – Thoracic facet RFL. The Cleveland Clinic 16th Annual Pain Management Symposium, Las Vegas, NV February.

2014 "Digital subtraction angiography" lecture, cadaver workshop in Cervical transforaminal epidural injection technique. American Society for Regional Anesthesia and Pain Medicine Annual Scientific Meeting San Francisco, California December.

2016 "RF denervation of the hip and knee" Cadaveric Workshop. New York and New Jersey Societies of Interventional Pain Physicians Annual Meeting. Jersey City, NJ November.

2016 "Migraine headache", "RF denervation of the knee" – Problem based learning discussion."RF denervation of cervical and thoracic facet joints", "RF denervation of the hip and knee" Cadaveric workshops. American Society for Regional Anesthesia and Pain Medicine, San Diego, CA November.

2017 ”Cervical and thoracic transforaminal epidural injections”, “RF denervation of the hip and knee” Cadaveric workshops. American Society for Regional Anesthesia and Pain Medicine, Orlando, FL November.
2018 “Cervical radiculopathy and stenosis” Lecture. Florida Society of Interventional Pain Physicians, Palm Beach, FL July.
2018 “Professionalism in Interventional Pain Practice”, “Critical review of Knee RF outcome literature”, “New frontiers in discogenic pain”, New Jersey/New York Societies of Interventional Pain Physicians. Jersey City, NJ November.
2018 “Reading and Interpretation of Spinal Imaging and EMG: Correlating studies to Pain Symptoms/Correlating MRI Findings to Pain Generators” Lecture CME. “Low back pain in 2018: New Insights and Better Outcomes/Notable Recent Evidence for Spine Interventions” Lecture discography and biacuplasty” ,“Direct and indirect lumbar decompression” Cadaver workshop . American Society for Regional Anesthesia and Pain Medicine 17th Annual Meeting, San Antonio, TX November.

SERVICE

Committee membership:

1992-1992 Medical Executive Committee, Operating Room Committee. Franklin Square Hospital, Philadelphia, PA.
1992-1995 Medical Executive Committee, Surgical Services Committee. Burdette Tomlin Memorial Hospital, Cape May Court House, NJ
2015- present Novitas Medicare JL - Clinical Advisory Committee Member
2021 Novitas Medicare – National subject matter expert testimony – Epidural steroid injections
2019-2021 CME Committee – Swedish Hospital, Englewood, CO